PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2002-113809

(43)Date of publication of application : 16.04.2002

(51)Int.Cl. B32B 15/08
B29C 65/02
B65D 1/09
B65D 1/16
B65D 8/16
C23C 22/00
C23C 28/00
C25D 5/26
// B21D 22/28
B29K 67:00
B29L 9:00

(21)Application number : 2000-310974

(22)Date of filing : 11.10.2000

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(54) RESIN FILM LAMINATE PLATING STEEL SHEET, CAN USING THE SAME AND METHOD FOR MANUFACTURING RESIN FILM LAMINATE PLATING STEEL SHEET

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a practical resin film laminate plating steel sheet having excellent corrosion resistance for a content having strong corrosiveness and excellent processing adhesive properties of a film when used as a material for a can, the can using the same and a method for manufacturing the resin film laminate plating steel sheet.

SOLUTION: The method for manufacturing the resin film laminate plating steel sheet comprises the steps of forming a prescribed amount of an Sn-plating layer or a prescribed amount of an Ni-plating layer and an Sn-plating layer on the surface of the steel sheet, forming an organically treated coating layer having a prescribed thickness on its upper layer, and further laminating a non- stretched resin film on its upper layer.

LEGAL STATUS

[Date of request for examination] 19.01.2005

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]
[Claim 1] The resin film laminating plating steel plate with which Sn plating layer is formed in a steel plate front face, an organic processing coat layer is formed in the upper layer, and it comes to carry out the laminating of the resin film of non-orientation to the upper layer further.
[Claim 2] The resin film laminating plating steel plate with which sequential formation of nickel plating layer and the Sn plating layer is carried out on a steel plate front face, and an organic processing coat layer is formed in the upper layer, and it comes to carry out the laminating of the resin film of non-orientation to the upper layer further.
[Claim 3] The resin film laminating plating steel plate according to claim 1 or 2 whose thickness of an organic processing coat is 0.02-1 micrometer.
[Claim 4] The resin film laminating plating steel plate according to claim 1 to 3 with which an organic processing coat consists of an acrylic modified epoxy resin.
[Claim 5] The resin film laminating plating steel plate according to claim 1 to 3 with which an organic processing coat consists of epoxy / an acrylic / phenol resin.
[Claim 6] The resin film laminating plating steel plate according to claim 1 to 3 with which an organic processing coat consists of epoxy/phenol resin.
[Claim 7] The resin film laminating plating steel plate according to claim 1 to 3 which is the coat with which an organic processing coat comes to carry out spreading desiccation of the silane coupling agent.
[Claim 8] The resin film laminating plating steel plate according to claim 1 or 2 with which it comes to form Sn plating layer in the amount of 100 - 2800 mg/m2.
[Claim 9] The resin film laminating plating steel plate according to claim 2 with which it comes to form nickel plating layer in the amount of 10 - 100 mg/m2.
[Claim 10] The resin film laminating plating steel plate according to claim 1 to 9 which is the coat which a resin film becomes from the polyester resin which is intrinsic viscosity 0.6-1.4.
[Claim 11] The can which comes to use a resin film laminating plating steel plate according to claim 1 to 10.
[Claim 12] The manufacture approach of the resin film laminating plating steel plate which is made to form an organic processing coat so that thickness may be set to 0.02-1 micrometer, subsequently heats, contacts the front face in the film which consists of polyester resin which is intrinsic viscosity 0.6-1.4, sandwiches both and sticks them by pressure with one pair of pressure rolls after performing Sn plating of the amount of per [100] one side - 2800 mg/m2 to both sides of a steel plate.
[Claim 13] The manufacture approach of the resin film laminating plating steel plate which is made to form an organic processing coat so that thickness may be set to 0.02-1 micrometer, subsequently heats, contacts the front face in the film which consists of polyester resin which is intrinsic viscosity 0.6-1.4, sandwiches both and sticks them by pressure with one pair of pressure rolls after performing nickel plating of the amount of per [10] one side - 100 mg/m2 to both sides of a steel plate and performing Sn plating of the amount of 100 - 2800 mg/m2 subsequently.
[Claim 14] The manufacture approach of a resin film laminating plating steel plate according to claim 12

or 13 that the temperature to heat is below the melting point of Sn.
[Claim 15] The manufacture approach of a resin film laminating plating steel plate according to claim 12 to 14 that the temperature to heat is below the melting point of polyester resin.
[Claim 16] The manufacture approach of a resin film laminating plating steel plate according to claim 12 or 13 that an organic processing coat consists of an acrylic modified epoxy resin.
[Claim 17] The manufacture approach of a resin film laminating plating steel plate according to claim 12 or 13 that an organic processing coat consists of epoxy / an acrylic / phenol resin.
[Claim 18] The manufacture approach of a resin film laminating plating steel plate according to claim 12 or 13 that an organic processing coat consists of epoxy/phenol resin.
[Claim 19] The manufacture approach of a resin film laminating plating steel plate according to claim 12 or 13 that an organic processing coat consists of a coat which comes to carry out spreading desiccation of the silane coupling agent.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the manufacture approach of a resin film laminating plating steel plate, the can which used it, and a resin film laminating plating steel plate. Even after extracting a resin film laminating plating steel plate and performing ironing in more detail, it is related with the manufacture approach of the resin film laminating plating steel plate which has the processing adhesion which was excellent in the resin enveloping layer, the can which extracts and comes to carry out ironing of it, and the resin film laminating plating steel plate used for it.
[0002]
[Description of the Prior Art] In recent years, the oriented film which extended polyester resin in the biaxial direction is covered to a metal plate, and spinning and the can which extracted in order to raise the rate of thinning of the can side-attachment-wall section further, and carried out canning using the severe fabrication approach using ironing etc. are mainly used for the application of a drink can. It is very difficult for the resin film covered by the metal-plate front face when ironing of this biaxial orientation polyester-resin film cladding was extracted and carried out to be unable to respond to large processing of deformation completely, but for a minute crack to arise on a film, for corrosion resistance to deteriorate, or for a film to break and carry out body breaking at the time of processing, and for canning to become impossible, to raise further the rate of thinning of the can side-attachment-wall section by spinning or diaphragm ironing, and to aim at the cost cut of a can.
[0003] As a metal plate which covers a polyester resin film, the electrolysis chromate treatment steel plate (it is also called chromium plated tinfree steel or TFS) which made the lower layer chromium metal layer and the layer which consists of two-layer [of the upper chromium hydration oxide layer] form on a steel plate has mainly been used abundantly from a viewpoint of processing adhesion. However, when a polyester resin film is covered to TFS, it fabricates with 2 piece cans with which the drum section and the pars basilaris ossis occipitalis were united with spinning and diaphragm ironing and it is filled up with contents, such as a strong, acid corrosive drink, the corrosion resistance of TFS of the covering substrate of a resin film may corrode rather than may be enough.
[0004] Therefore, to use Sn plating steel plate which has the corrosion resistance which was excellent to strong corrosive contents as a covering substrate of a resin film is tried. JP,61-3676,B heats Sn plating steel plate to the temperature below the melting point of Sn, and after contacting and pressurizing and carrying out temporary adhesion of the polyester resin film, it is indicating the approach of heating more than the melting point of Sn and carrying out actual adhesion. Compared with the resin covering steel plate which makes TFS a covering substrate, the resin covering plating steel plate obtained by this approach is lacking in the processing adhesion of a resin coat, and when spinning and diaphragm ironing are performed, a resin coat exfoliates, and it cannot be fabricated with a resin covering can.
[0005] As for JP,3-239538,A, a steel plate front face has many steel plate outcrops, and it performs Sn plating with which electrodeposited Sn was scattered, using Sn plating liquid of a specific presentation as an attempt which improves the above corrosion resistance and processing adhesion, and is indicating

the resin covering steel plate in which the lower layer chromium metal layer and the layer which consists of two-layer [of the upper chromium hydration oxide layer] were subsequently made to form and which carried out the laminating of the polyester-resin film to Sn plating steel plate and the complex surface treated steel sheet of TFS. Although this resin covering steel plate is excellent in corrosion resistance, the process in which it makes two-layer [of Sn plating metallurgy group chromium layer and a chromium hydration oxide layer] form is complicated, and it is difficult to control a steel plate exposure aspect product within fixed limits, and deficient in it to practicality.

[0006] Moreover, after JP,5-98465,A performs Sn plating to a steel plate or performs still more nearly little nickel plating, it is heated more than the melting point of Sn, and after Sn has fused and it carries out the pressurization laminating of the thermoplastics film, it is indicating the approach of quenching immediately. After Sn has fused, in case according to this approach a thermoplastics film is contacted and a pressurization laminating is carried out, the oxide film generated on Sn front face is destroyed, and the activity metal Sn supposes that it comes to touch a thermoplastics film directly and the outstanding processing adhesion will be acquired. However, according to this approach, immediately after carrying out the laminating of the thermoplastics film, although a resin covering plating steel plate shows the outstanding processing adhesion, the inclination for processing adhesion to fall comes to be shown as the passage of time is carried out.

[0007]

[Problem(s) to be Solved by the Invention] When this invention conquers the above-mentioned fault and uses it as a charge of can material, it aims at offering the manufacture approach of the practical resin film laminating plating steel plate which has the corrosion resistance which was excellent to strong corrosive contents, and was excellent also in the processing adhesion of a coat, the can using it, and a resin film laminating plating steel plate.

[0008]

[Means for Solving the Problem] As for the resin film laminating plating steel plate of this invention, Sn plating layer is formed in a steel plate front face. The resin film laminating plating steel plate with which an organic processing coat layer is formed in the upper layer, and it comes to carry out the laminating of the resin film of non-orientation to the upper layer further, Or sequential formation of nickel plating layer and the Sn plating layer is carried out, and an organic processing coat layer is formed in a steel plate front face at the upper layer. It is the resin film laminating plating steel plate with which it furthermore comes to carry out the laminating of the resin film of non-orientation to the upper layer, and the thickness of an organic processing coat is 0.02-1 micrometer, It is either of the coats with which an organic processing coat comes to carry out spreading desiccation of an acrylic modified epoxy resin, epoxy / acrylic / phenol resin, epoxy/phenol resin, and the silane coupling agent, It is characterized by that Sn plating layer is formed in the amount of 100 - 2800 mg/m2, that nickel plating layer is formed in the amount of 10 - 100 mg/m2, and being the coat which a resin coat turns into from the polyester resin which is intrinsic viscosity 0.6-1.4.

[0009] The can of this invention is a can which comes to use one of the above-mentioned resin film laminating plating steel plates. Moreover, the manufacture approach of the resin film laminating plating steel plate of this invention After performing Sn plating of the amount of per [100] one side - 2800 mg/m2 to both sides of a steel plate, Make an organic processing coat form so that thickness may be set to 0.02-1 micrometer, and, subsequently it heats. The front face is contacted in the film which consists of polyester resin which is intrinsic viscosity 0.6-1.4. The manufacture approach of the resin film laminating plating steel plate which sandwiches both and sticks them by pressure with one pair of pressure rolls, Or nickel plating of the amount of per [10] one side - 100 mg/m2 is performed to both sides of a steel plate. Subsequently, after performing Sn plating of the amount of 100 - 2800 mg/m2, an organic processing coat is made to form so that thickness may be set to 0.02-1 micrometer. Subsequently, heat and the front face is contacted in the film which consists of polyester resin which is intrinsic viscosity 0.6-1.4. It is the manufacture approach of the resin film laminating plating steel plate which sandwiches both and sticks them by pressure with one pair of pressure rolls, and the temperature to heat is below the melting point of Sn, It is characterized by that the temperature to heat is below the

melting point of polyester resin, and an organic processing coat consisting of either of the coats which come to carry out spreading desiccation of an acrylic modified epoxy resin, epoxy / acrylic / phenol resin, epoxy/phenol resin, and the silane coupling agent.

[0010]

[Embodiment of the Invention] In this invention, when it uses as a charge of can material, it has the corrosion resistance which was excellent to strong corrosive contents. And the result wholeheartedly examined for the purpose of obtaining the practical resin film laminating plating steel plate excellent also in the processing adhesion of a coat, Sn plating layer of a constant rate or nickel plating layer of a constant rate, and Sn plating layer are formed in a steel plate front face. It became possible to attain the above-mentioned purpose by forming an organic processing coat layer in the upper layer by fixed thickness, and considering as the resin covering plating steel plate which carried out the laminating of the resin film of non-orientation to the upper layer further. Sn deposit has the description that the corrosion of the steel which is a substrate metal can be prevented, with that electrochemical property -- on the other hand -- ** -- it carries out and a stannic-acid ghost layer is easy to be formed in a front face, since this stannic-acid ghost layer has small cohesive force, it is easy to be destroyed easily and it has the fault that the adhesion force with a resin layer is inadequate. While maintaining adhesion with a resin layer on the outstanding level by preparing an organic processing coat layer on Sn plating layer of a galvanized steel sheet, and preparing a non-orientation resin film on it according to this invention, metaled corrosion under a coat can also be prevented. An organic processing coat controls formation of Sn oxide film, and this is considered because the adhesion of a resin coat is raised.

[0011] The contents are explained about this invention below. First, the plating steel plate used as the covering substrate which carries out the laminating of the resin film of a resin film laminating plating steel plate is explained. Following either of two kinds is used as a plating steel plate.

(1) The plating steel plate with which Sn plating layer is formed in a steel plate front face, and it comes to form an organic processing coat layer in the upper layer.

(2) The plating steel plate with which sequential formation of nickel plating layer and the Sn plating layer is carried out on a steel plate front face, and it comes to form an organic processing coat layer in the upper layer.

[0012] In the case of (1) which makes only Sn plating layer form in a steel plate front face, it galvanizes in the amount of 100-2800mg/m2 using plating baths used for manufacture of a tin plate, such as the well-known Ferro Stan bath and a halogen bath. Corrosion resistance with the amount of plating sufficient by less than two 100 mg/m is not acquired, but if 2800 mg/m2 is exceeded, the corrosion resistance improvement effectiveness will be saturated. In the case of (2) which carries out sequential formation, nickel plating layer and Sn plating layer are galvanized in the amount of 10 - 100 mg/m2 using a Watts bath well-known as a nickel plating bath, or a sulfamic acid bath on a steel plate front face. Corrosion resistance improves further by preparing this nickel plating layer. When effectiveness is not accepted in the improvement in corrosion resistance [amount / of plating] but 100 mg/m2 is exceeded, the effectiveness of corrosion-resistant improvement is saturated and it becomes economically advantageous [in less than two 10 mg/m] less. Besides, Sn plating layer is made to form still like the case of (1). The amount of plating is limited for the same reason as the case of (1).

[0013] As mentioned above, after making Sn plating layer or nickel plating layer, and Sn plating layer form in a steel plate front face, **** processing which heats a plating steel plate more than the melting point of Sn may be performed as it carries out by manufacture of a tin plate. By performing **** processing, an alloy layer is formed between a steel plate and a plating layer, and corrosion resistance improves. Especially when nickel plating layer is formed in the bottom of Sn plating layer, a precise alloy layer generates, and the outstanding corrosion resistance is acquired.

[0014] An organic processing coat layer is made to form in the upper layer of the plating layer of the plating steel plate obtained as mentioned above. An organic processing coat layer is formed by making it dry, after applying a solvent system or a water-soluble organic compound using the usual methods of application, such as the roll coat method. The coat which comes to carry out spreading desiccation of the epoxy / acrylic / phenol resin which mixes the epoxy/phenol resin, the epoxy resin, acrylic resin, and

phenol resin which mix an acrylic modified epoxy resin, an epoxy resin, and phenol resin, and change, and changes, and the silane coupling agent as an organic compound is used suitably. As for spreading thickness, it is desirable that it is 0.02-1 micrometer by the thickness after desiccation. It is very difficult to apply to homogeneity without nonuniformity by the thickness of less than 0.02 micrometers, and uniform processing adhesion cannot be made to discover. Processing adhesion falls [come] and is not desirable if spreading thickness exceeds 1 micrometer. The plating steel plate used as the covering substrate which carries out the laminating of the resin film as mentioned above is obtained.

[0015] Next, the resin film which carries out a laminating to the plating steel plate obtained as mentioned above is explained. As for the resin film applied to this invention, it is desirable that it is the film which can apply either a monolayer film or the double layer film more than two-layer, and consists of thermoplastics, especially polyester resin. As polyester resin, what has ester units, such as ethylene terephthalate, ethylene isophthalate, butylene terephthalate, and butylene isophthalate, is desirable, and it is desirable that it is polyester which makes a subject at least one kind of ester unit further chosen from these. At this time, copolymerization of each ester unit may be carried out, and it may blend and use two more or more kinds of the homopolymers or copolymerization polymers of each ester unit. It is things other than the above and the things using propylene glycol, a diethylene glycol, neopentyl glycol, cyclohexane dimethanol, pentaerythritol, etc. as an alcoholic component of an ester unit, such as a thing using naphthalene dicarboxylic acid, an adipic acid, a sebacic acid, trimellitic acid, etc. as an acid component of an ester unit, may be used. This polyester may be the layered product of two or more sorts of polyester layers which consist of gay polyester, copoly ester, or blend objects that consist of these two or more sorts. For example, the lower layer of polyester film can be used as the copolymerized polyester layer excellent in the heat adhesive property, and the upper layer of this tape can be used as a PET layer or a reforming PET layer excellent in reinforcement, thermal resistance, and also the barrier nature to a corrosion component.

[0016] It is premised on using the film which consists of polyester resin of non-orientation so that a postscript may be carried out in this invention. In the activity which carries out the laminating of the polyester resin film to a plating steel plate resin goes out or Even if it performs severe fabrication like spinning or diaphragm ironing to the plating steel plate which carried out the laminating of the polyester resin film, can shave resin or it does not get damaged. Moreover, in order for a crack to arise, to be divided or to make it not exfoliate further, it is necessary to raise the intrinsic viscosity of resin and to make resin strengthen. For this reason, it is desirable to make intrinsic viscosity (IV) of the above-mentioned polyester resin into the range of 0.6-1.4, and it is more desirable to consider as the range of 0.8-1.2. Intrinsic viscosity When less than 0.6 polyester resin is used, the reinforcement of resin falls extremely and cannot apply to the can which performs and fabricates spinning and diaphragm ironing. On the other hand, the intrinsic viscosity of resin If 1.4 is exceeded, the melt viscosity at the time of carrying out heating melting of the resin will become extremely high, and the activity which carries out the laminating of the polyester resin film to a plating steel plate will become very difficult.

[0017] In the case of a monolayer film, it is desirable that it is 5-60 micrometers, and, as for the thickness of a resin film, it is more desirable that it is 10-40 micrometers. When thickness is less than 5 micrometers, and it is easy to produce a defect in the resin layer after the activity which carries out a laminating to a plating steel plate becoming remarkably difficult and performing spinning and diaphragm ironing, it fabricates with a can and it is filled up with contents, the permeability-proof over a corrosion component is not enough, either. Although permeability-proof will become enough if thickness is made to increase, it becomes disadvantageous economically to make it the thickness exceeding 60 micrometers. Although the ratio of the thickness of each class is changed from viewpoints, such as effect which gives the flavor of fabrication nature, and permeability-proof or contents in the case of a double layer film, the thickness of each class is adjusted so that total thickness may be set to 5-60 micrometers. Moreover, in case film production processing of the resin film is carried out, a color pigment, a stabilizer, an antioxidant, an unguent, etc. are made to contain in the range which does not spoil a property required in resin, and a film may be produced on a film.

[0018] The resin film of non-orientation carries out film production processing as follows. That is,

heating fusion of the resin pellet is carried out using an extruder at temperature higher 20-40 degrees C than the melting out temperature of resin, and it rolls round to a coiler as a non-oriented film, without extruding and extending melting resin on the casting roll cooled in the shape of a film from the T die.
[0019] Next, how to carry out the laminating of the resin film to a plating steel plate is explained. It heats continuously, undoing and loosening said plating steel plate band-like [long] first rolled round by the coiled form. more than the melting point of Sn whenever [stoving temperature / whose] is a plating layer -- and a resin film (the resin layer to which a plating steel plate is touched in the case of a double layer film --) Above the melting point of Sn, more than a melting out temperature [that it is the same as that of the following] And under the melting out temperature of a resin film under the melting point of Sn -- and more than the melting out temperature of a resin film -- under the melting point of Sn -- and under the melting point of Sn that is easy to do a laminating activity although which temperature of under the melting out temperature of a resin film is sufficient -- and it is desirable to heat in the range more than the melting out temperature of a resin film. However, since a non-oriented film is pasted up on a plating steel plate also at the temperature below the melting out temperature of a resin film, it is under the melting point of Sn, and even if it heats under to the melting out temperature of a resin film, the laminating of the resin film can be carried out to a plating steel plate. Desirable temperature is 100-232 degrees C, and more desirable temperature is 150-220 degrees C.
[0020] The plating steel plate band-like [long] which moves continuously is heated to the above-mentioned temperature requirement, these one side or both sides are contacted in the aforementioned resin film, with one pair of pressure rolls, both are inserted, and are stuck by pressure, and it quenches immediately. The resin film laminating plating steel plate of this invention is obtained as mentioned above.
[0021] As the can using the resin film laminating plating steel plate of this invention is the following, it is fabricated with a can. That is, a circular blank is pierced from a resin film laminating plating steel plate, subsequently spinning of 1 - two or more stages is performed, and spinning of further 1 - two or more stages is performed, or ironing is performed further, and a pars basilaris ossis occipitalis and a drum section are fabricated by one, and fabricate with the can which raised the rate of thinning of the can side-attachment-wall section. In giving uniaxial orientation to the resin film layer of a boiler barrel on the occasion of shaping to this can in connection with the plastic flow to the can shaft orientations of a resin film laminating plating steel plate and performing ironing, the same plane orientation as rolling is given, and such molecular orientation is useful to improvement in thermal resistance and a mechanical strength.
[0022]
[Example] Next, an example explains this invention to a detail further.
Board thickness: (Example) The plating layer shown in Table 1 was made to form in both sides of a low-carbon steel plate (0.18mm and board width:800mm). Subsequently, the organic resin coat layer shown in Table 1 was made to form in the plating side of these plating steel plates. The resin indicated with the notation of the resin class of front Naka is resin shown below, respectively, and all applied and dried it using the roll coat method.
AE : it is the roll coat EP about 30% water solution of roll coat EAP:water solubility epoxy / acrylic / phenol resin in 28% water solution of a water-soluble acrylic modified epoxy resin. : It is the roll coat SC about 20% solution of solvent system epoxy / phenol resin. : It is a roll coat [0023] about organosilane coupling material.
[Table 1]

めっき番号	めっき鋼板					区分
	めっき量 (mg/m²)		溶錫処理	有機樹脂皮膜		
	Ni	Sn		樹脂種類	厚さ(μm)	
A	—	80	無し	AE	0.5	比較例
B	—	100	無し	AE	0.5	本発明
C	—	1000	無し	AE	0.01	比較例
D	—	1000	無し	AE	0.02	本発明
E	—	1000	有り	AE	0.5	本発明
F	—	1000	有り	AE	1	本発明
G	—	1000	無し	AE	1.2	比較例
H	—	2800	無し	EAP	0.5	本発明
I	10	1000	有り	EAP	0.5	本発明
J	50	80	無し	EAP	0.5	比較例
K	50	100	無し	EAP	0.5	本発明
L	50	1000	有り	EP	0.5	本発明
M	50	2800	無し	EP	0.5	本発明
N	100	1000	無し	EP	0.5	本発明
O	100	1000	有り	SC	0.5	本発明

[0024] Subsequently, the plating steel plate of each plating number shown in Table 1 is heated to the temperature shown in Table 2. The copolymerized polyester resin which becomes the field which changes an external surface side when it fabricates with a can from ethylene terephthalate (88-mol %) and ethylene isophthalate (12-mol %) (PETI12 shows hereafter (12 mol of ethylene isophthalate number)) (intrinsic viscosity: 0.8, melting out temperature:228 degree C) Make it come 20% to contain titanium oxide system white pigments. Thickness: It contacted, respectively, with one pair of pressure rolls, the transparence resin film of the non-orientation shown in the sample numbers 1-23 of Table 2 was inserted into the field which changes an external surface side when a 15-micrometer non-oriented film is fabricated with a can, and was stuck to it by pressure, and it was immersed underwater immediately, it quenched, and the resin film laminating plating steel plate was obtained. In Table 2, the resin film indicated with the notation of a resin presentation of front Naka is a resin film shown below, respectively.

PETI12 : Copolymerized polyester resin which consists of ethylene terephthalate (88-mol %) and ethylene isophthalate (12-mol %) (melting out temperature: 228 degrees C)

PET : Polyethylene terephthalate (it is a polymerization about ethylene terephthalate (100-mol %))

(melting out temperature: 267 degrees C)
PETI5 (15) / PET12 (10) : Thickness to which a lower layer serves as thickness:15micrometer copolymerized-polyester resin with which the upper layer consists of ethylene terephthalate (95 mol %) and ethylene isophthalate (five mol %) (melting out temperature: 251 degrees C) from ethylene terephthalate (88 mol %) and ethylene isophthalate (12 mol %) (melting out temperature: 228 degrees C): Two-layer film which consists of 10-micrometer copolymerized polyester resin [0025]
[Table 2]

試料番号	めっき番号	樹脂フィルム積層条件			区分
		内面側樹脂フィルム		めっき鋼板加熱温度(℃)	
		樹脂組成 (厚さ:μm)	固有粘度		
1	E	PETI12 (25)	0.4	200	比較例
2	E	PETI12 (25)	0.6	200	本発明
3	A	PETI12 (25)	0.8	200	比較例
4	B	PETI12 (25)	0.8	200	本発明
5	C	PETI12 (25)	0.8	180	比較例
6	D	PETI12 (25)	0.8	180	本発明
7	E	PETI12 (25)	0.8	230	本発明
8	F	PETI12 (25)	0.8	230	本発明
9	G	PETI12 (25)	0.8	120	比較例
10	H	PETI12 (25)	0.8	120	本発明
11	I	PETI12 (25)	0.8	200	本発明
12	J	PETI12 (25)	0.8	200	比較例
13	K	PETI12 (25)	0.8	200	本発明
14	L	PETI12 (25)	0.8	200	本発明
15	M	PETI12 (25)	0.8	210	本発明
16	N	PETI12 (25)	0.8	210	本発明
17	E	PETI12 (25)	1.4	190	本発明
18	E	PETI12 (5)	0.8	190	本発明
19	E	PETI12 (60)	0.8	190	本発明
20	E	PETI12 (25)	0.8	190	本発明
21	E	PET (25)	0.7	230	本発明
22	E	PETI5 (15)/PETI12 (10)	0.7/0.8	220	本発明
23	O	PETI5 (15)/PETI12 (10)	0.7/0.8	150	本発明

[0026] The resin film laminating steel plate created as mentioned above was extracted as follows, and was fabricated with the cover-printing can. first -- diameter: -- after piercing in a 160mm disc-like blank, as the field which carried out the laminating of the film colored white became the outside of a container, it performed spinning, and fabricated in the drawing container of the diameter of 100mm. Subsequently, redrawing processing was performed and it fabricated in the redrawing container of the diameter of 80mm. Redrawing ironing which performs redrawing processing and ironing for this redrawing container to coincidence was performed, and it fabricated with the cylinder can which has a flange into a height:125mm part by can diameter:66mm. Subsequently, after trimming the upper limit section and setting height to 122mm, diameter reduction processing of the upper limit section was carried out, and the path of an open end was set to 57mm. Subsequently, jutted out and processed the open end toward the outside of a can, the flange was made to form so that the path of a flange edge may be set to 62mm,

and it considered as the can of the last configuration before being filled up with contents.
[0027] It fabricated as mentioned above from the resin film laminating steel plate of sample numbers 1-23, and extracted, and the property of a cover-printing can was evaluated as follows.
[Processing adhesion] Ironing was extracted and carried out, macro-scopic observation of the can after carrying out flange forming was carried out, and the following criteria estimated processing adhesion.
[0028]
O : exfoliation of a resin film is not accepted.
O : exfoliation of few [extent which does not pose a problem practically] resin films is accepted in the flange processing section.
**: Exfoliation of the resin film of extent which poses a problem practically is accepted in the flange processing section.
x: Exfoliation of a resin film is accepted in the whole flange processing section.
[0029] [Corrosion resistance] Ironing was extracted and carried out, the can after carrying out flange forming was filled up with the acid drink (trade name: an acerola drink, NICHIREI Make) of pH:2.6, by the flange, the canopy was double-seaming carried out, and was sealed, and it was immersed into iced water. It takes out after 5 minutes, and the reinforcing bars (weight: 1kg) which attached diameter:1 / 2 inches shot at the tip at intervals of 15mm by the circumferencial direction were dropped on the can external surface of temperature with a temperature of about 5 degrees C from height of 40mm, and the crevice was made to form in it. After carrying out the passage of time for one month at 37 degrees C by this condition, the amount of metals which opened and was eluted to the acid drink inside a can was measured using the atomic absorption method, and the following criteria estimated corrosion resistance from those some.
O more than less than [:0.3ppm] O:0.3ppm -- and more than less than [0.5ppm] **:0.5ppm -- and less than [1.0 ppm] x: -- 1.0 ppm or more of these results are shown in Table 3.
[0030]
[Table 3]

試料番号	特性評価結果		区分
	加工密着性	耐食性	
1	◎	△	比較例
2	◎	○	本発明
3	◎	×	比較例
4	◎	○	本発明
5	×	—	比較例
6	○	○	本発明
7	◎	◎	本発明
8	◎	○	本発明
9	△	—	比較例
10	◎	◎	本発明
11	◎	◎	本発明
12	◎	△	比較例
13	◎	○	本発明
14	◎	◎	本発明
15	◎	◎	本発明
16	◎	◎	本発明
17	◎	◎	本発明
18	◎	○	本発明
19	◎	◎	本発明
20	○	◎	本発明
21	○	○	本発明
22	◎	◎	本発明
23	◎	◎	本発明

注）－：皮膜剥離大で内容液を充填せず

[0031] As shown in Table 3, the resin film laminating plating steel plate of this invention has the outstanding processing adhesion, and the corrosion resistance which was excellent also to the acidity drink with corrosive [extract and strong / a cover-printing can] fabricated using the resin film laminating plating steel plate of this invention is shown.

[0032]

[Effect of the Invention] After this invention performs Sn plating or nickel plating, and Sn plating to a steel plate front face, it makes an organic processing coat form and subsequently heats, it is the resin film laminating plating steel plate which contacts and comes to stick by pressure the film which consists of polyester resin which is intrinsic viscosity 0.6-1.4 to the front face, and even if it performs diaphragm ironing, it shows the processing adhesion which a resin film did not exfoliate and was excellent. Moreover, even when it extracts using the resin film laminating plating steel plate of this invention, the can which performed and fabricated ironing is excellent in corrosion resistance and it is filled up with an acid drink, there is very little metal elution.

[Translation done.]